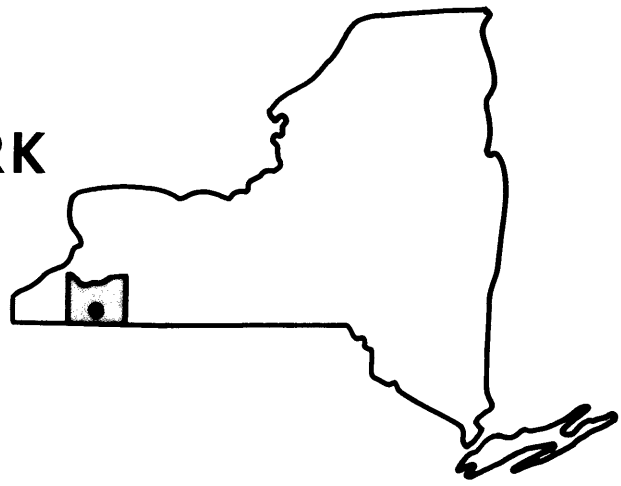
FLOOD INSURANCE STUDY

CITY OF SALAMANCA, NEW YORK
CATTARAUGUS COUNTY



OCTOBER 1977

U.S. DEPARTMENT of HOUSING & URBAN DEVELOPMENT
FEDERAL INSURANCE ADMINISTRATION

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PUBLISHED SEPARATELY:

Flood Insurance Rate Map Index

Flood Insurance Rate Map Panels 360097 0001C-0003C

1.0 INTRODUCTION

1.1 Purpose of Study

The purpose of this Flood Insurance Study is to investigate the existence and severity of flood hazards in the City of Salamanca, Cattaraugus County, New York, and to aid in the administration of the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973. Initial use of this information will be to convert Salamanca to the regular program of flood insurance by the Federal Insurance Administration (FIA). Further use of the information will be made by local and regional planners in their efforts to promote sound land use and flood plain development.

1.2 Coordination

The purpose of the Flood Insurance Study was explained at a meeting held on July 30, 1975, between representatives of the City of Salamanca, the FIA, the Cattaraugus County Planning Board, the New York State Department of Environmental Conservation (NYSDEC) and the Pittsburgh District of the U. S. Army Corps of Engineers (COE).

A search for data was made at all levels of government. The U. S. Geological Survey (USGS) was contacted to obtain contour maps showing drainage boundaries, and also to obtain stream flow records for Great Valley Creek and the Allegheny River.

On November 8, 1976, a meeting was held with officials of the City of Salamanca to obtain additional local input. The final meeting of consultation and coordination was held on January 19, 1977, where the final draft of the Flood Insurance Study was presented for further local comment. Attending that meeting were the FIA, the NYSDEC, and representatives from the City of Salamanca. No objections to the report findings were registered.

1.3 Authority and Acknowledgements

The source of authority for this Flood Insurance Study is the National Flood Insurance Act of 1968, as amended.

The hydrologic and hydraulic analyses for this study were performed by the New York State Department of Environmental Conservation for

the Federal Insurance Administration under Contract Number H-3856. This work, which was completed in December 1976, covered all flooding sources in Salamanca studied by detailed methods. For flooding sources studied by approximate methods, flood boundaries were delineated using special Flood Hazard Boundary Maps prepared in 1973 by Gannett, Fleming, Corddry, and Carpenter, Inc., under contract to the Federal Insurance Administration.

2.0 AREA STUDIED

2.1 Scope of Study

This Flood Insurance Study covers the incorporated area of the City of Salamanca. The area of the study is shown on the Vicinity Map (Figure 1).

Because of the heavy development within the flood plain, it was agreed between officials of the city and the FIA that the Allegheny River, Great Valley Creek, and Little Valley Creek were to be studied in detail. The areas studied in detail were chosen with consideration given to all forecasted development and proposed construction for the next five years (through March 1980).

Newton Run and Titus Run, and two other small unnamed streams referred to as Tributaries Nos. 1, 2 and 3 were studied by approximate methods.

2.2 Community Description

The City of Salamanca, located in central Cattaraugus County, is in southwestern New York. It is approximately 50 miles south of Buffalo. The City of Salamanca has developed from a small community which was originally called Bucktooth. In 1862 its name was changed to Salamanca in honor of a Spanish banker who helped finance the Atlantic and Great Western Railroad which opened the area to commerce.

The growth of Salamanca began with the arrival of the railroads. In the beginning, there was a junction in what is now West Salamanca of the Erie Railroad and the Atlantic and Great Western Railroad. This junction was later moved, in the fall of 1866, to its present location which is more toward the center of the city. Today, both CONRAIL and the Baltimore and Ohio Railroads maintain large junctions within Salamanca. The railroads provide a primary factor in the local economy.

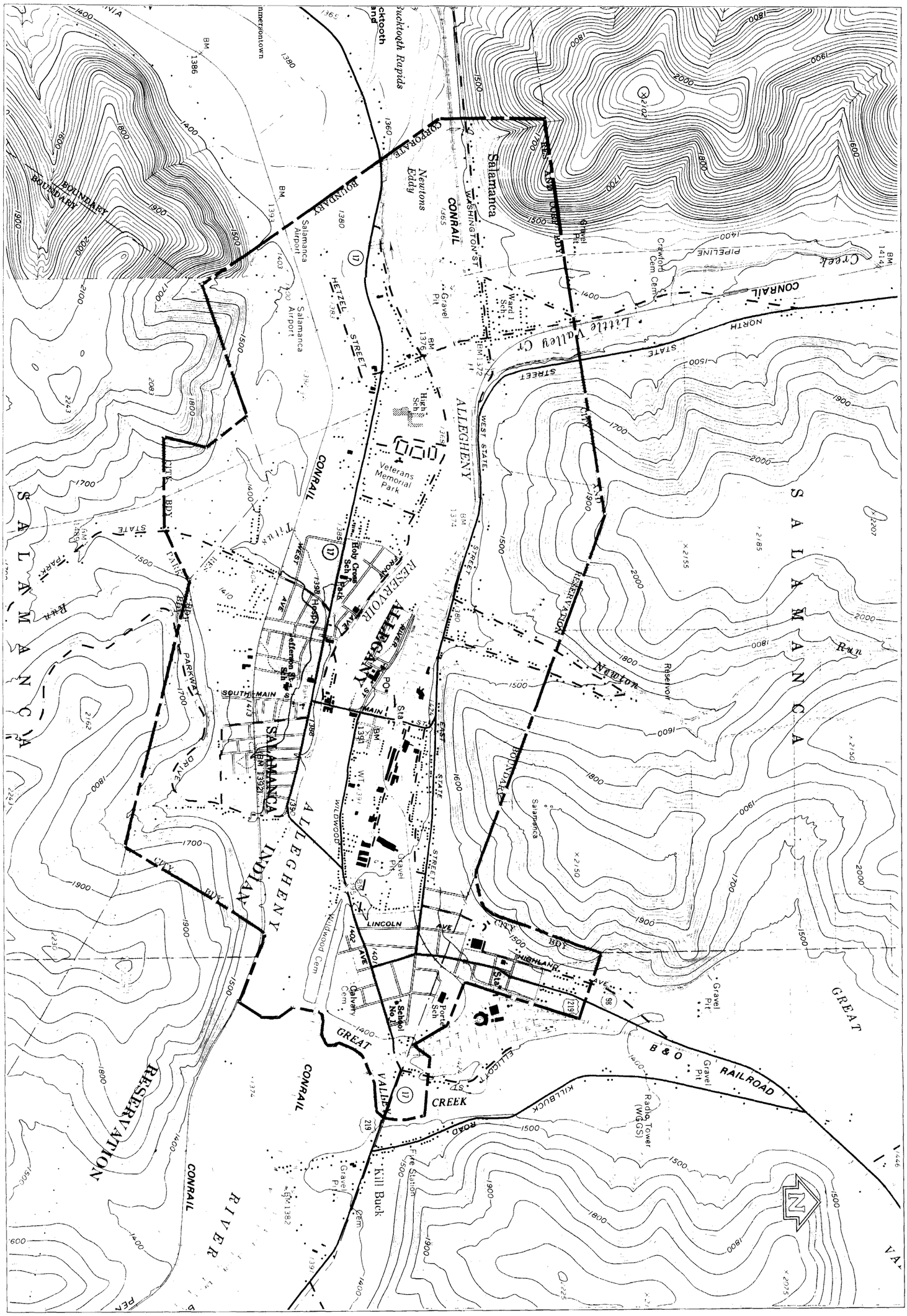


FIGURE 1

DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT
Federal Insurance Administration

CITY OF SALAMANCA, NY
(CATTARAUGUS CO.)

APPROXIMATE SCALE
2000 0 2000 4000 6000 FEET

VICINITY MAP

In addition to the railroads, the lumber industries and tanneries have been instrumental in the development of Salamanca. These were actually the first types of industries to locate in or near Salamanca, and examples of each are still in operation. Other related industries using lumber and leather in their finished product have also developed.

The City of Salamanca lies within the boundaries of the Allegheny Indian Reservation of the Seneca Nation of Indians. By an Act of Congress in 1875, the land was leased by the city from the Seneca Nation. The original act provided for 12-year leases, but was amended in 1890 to provide for a 99-year lease. The current lease commenced 1892 and will expire in 1991, at which time provision has been made for a 99-year renewal.

The development pattern in Salamanca is predominantly residential on the south side of the Allegheny River and commercial on the north side with the business district located in the center of the city and spanning the river. Residential development is also prevalent in the northeast corner.

The population of Salamanca was nearly 10,000 people in the first quarter of this century. Since then, however, it has shown a steady decline to the 1970 population level of 7,877 people, almost 18 percent less.

The climate is typical of temperate continental with some localized variations due to elevation differences. Average January and July temperatures are 23°F and 70°F respectively. Average annual precipitation is 44 inches with approximately 23 inches occurring as runoff (Reference 1).

There are three main watercourses in the City of Salamanca, the Allegheny River and two tributaries. The Allegheny River flows west through the center of the city with both banks being heavily developed. One tributary, Great Valley Creek, which is flowing south, has its confluence with the Allegheny River at the eastern edge of the city, where it forms a portion of the corporate limit. The second tributary is Little Valley Creek. The creek, which also flows south, crosses the northern corporate limit and enters into the Allegheny River approximately three miles downstream of the river's confluence with Great Valley Creek.

The Allegheny River which rises in Potter County, Pennsylvania, on the western slope of the Appalachian Mountains, flows in a wide loop through a portion of New York State and eventually merges with the Monongahela River at Pittsburgh to form the Ohio River.

The other two watercourses affecting the City of Salamanca are Little Valley Creek and Great Valley Creek, which have drainage areas of 46 square miles and 142 square miles, respectively. Both of these streams drain basins which are rural in nature, with most of the land occupied by woodlands or used for agriculture.

The Allegheny River near the lower limit of the city encompasses a total drainage area of approximately 1,663 square miles. The river is a well-defined watercourse which flows through the middle of the city from east to west and has a wide flood plain surrounded by steep hills. Elevations range between 2,400 feet above National Geodetic Vertical Datum of 1929 (NGVD) formerly referred to as mean sea level datum with 1929 general adjustment, at the hilltops to a streambed elevation of 1,345 NGVD at the center of the city.

Soils in the City of Salamanca are typically the silt loams found in the bottom land along the Allegheny River (Reference 2).

2.3 Principal Flood Problems

Due to the steep terrain of the surrounding area, Salamanca is subject to flash flooding from cyclonic disturbances of high intensity, even if such storms are of short duration. The most frequent floods result from these disturbances in winter or early spring augmented by melting snow.

Investigations indicate that flooding on Little Valley Creek, Great Valley Creek, and the Allegheny River occur at about the same time, usually as a result of a storm over most of the upper Allegheny Basin. It is possible, however, to have flooding on the two creeks, but not on the Allegheny River, as a result of more localized storms over the smaller basins.

There is no dependable record of flooding on Little Valley Creek. A partial record of flooding, however, exists for Great Valley Creek. In 1950, the USGS established a recording gage on the creek approximately 2.5 miles above the mouth. While this gage has a relatively short historical record, it was in operation to record two major flooding events in 1956 and 1967 before being discontinued in 1968.

A very good record of flooding is available for the Allegheny River. A chain gage was established in 1903 by the USGS at Red House which is approximately seven miles downstream from Salamanca. This gage was replaced by a recording gage in 1917.

Continuous records are available from this site until 1964 when it was abandoned in conjunction with the installation of another recording gage just upstream from the Main Street Bridge in Salamanca. There is only five percent difference in the drainage area of the two sites, so the records of the gage at Red House can be considered to be consistant with the gage at Salamanca. In addition, a gage to measure river stages was installed on the downstream side of the Main Street Bridge in 1958, by the COE. This gage is read daily by the Salamanca Fire Department.

The historical records which are available indicate that there have been three major floods in recent years; March 8, 1956; September 29, 1967; and June 23, 1972. Of these three floods, the one of June 1972 (tropical storm Agnes) is considered to have been the most severe causing an estimated $1,240,000 in flood damages. The gaged discharge of 76,000 cubic feet per second (cfs) for this storm is estimated to have a recurrence interval of approximately 160 years.

2.4 Flood Protection Measures

The COE constructed a flood control system for the City of Salamanca in 1968. The project consisted of a series of walls and dikes to protect three separate zones of the city. The first zone is on the south bank of the river and extends 1,200 feet upstream, and 16,000 feet downstream of the Main Street Bridge. The second zone, which is on the north bank of the river, extends 400 feet upstream, and 3,500 downstream of the Main Street Bridge. The third zone is on the north side of the river at the mouth of Little Valley Creek, and prevents flooding in all of West Salamanca.

The unconnected series of dikes and walls will protect only residential and commercial property subject to flooding. The undeveloped portion of the bottom land will continue to be subject to flooding. This system was designed to contain a flood which has a recurrence interval of approximately 80 years.

3.0 ENGINEERING METHODS

For flooding sources studied in detail in the community, standard hydrologic and hydraulic study methods were used to determine the flood hazard data required for this study. Floods having recurrence intervals of 10, 50, 100, and 500 years have been selected as having special significance for flood plain management and for flood insurance premium rates. The analyses reported here reflect current conditions in the drainage areas of the streams.

Figure 2 - City of Salamanca - Looking north along Center Street Bridge over Allegheny River during 1972 flood (tropical storm Agnes)

Figure 3 - City of Salamanca - Looking north along Main Street during 1972 flood (tropical storm Agnes)

Figure 4 - City of Salamanca - Looking east along Clinton Street (Between Carlton and East St.) during 1972 flood (tropical storm Agnes)

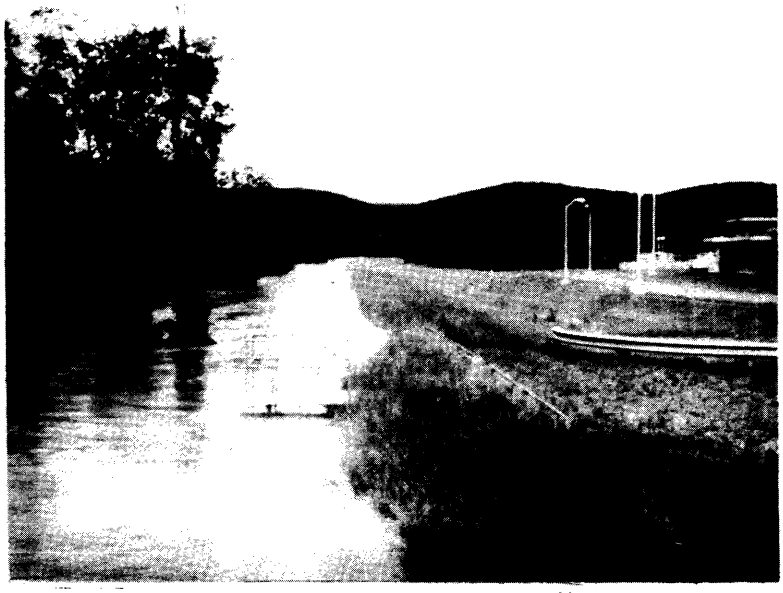


Figure 5 - City of Salamanca - Looking west along Salamanca Treatment Plant during 1972 flood (tropical storm Agnes)

3.1 Hydrologic Analyses

Hydrologic analyses were carried out to establish the peak discharge-frequency relationships for floods of the selected recurrence intervals for each stream studied in detail in the community.

On the Allegheny River, the peak discharge-frequency relationship was based primarily on a statistical analysis of the stage and discharge records of gaging stations at or near the City of Salamanca (Reference 3). These include the USGS gages at Salamanca and Red House, and the COE gage at Salamanca. The statistical procedures used in this analysis are those presented by Leo R. Beard which is the use of a log-Pearson Type III distribution as a base method for flood flow frequency studies (Reference 4). This methodology conforms with the uniform techniques for determining flood flow frequencies as set forth by the Hydrology Committee of the United States Water Resources Council (Reference 5).

To provide the hydrology for Little Valley Creek, use was made of a regionalized peak flow analysis which was prepared by the NYSDEC (Reference 6). This analysis used USGS Stream Gaging Records to establish peak flow relationships for selected points along waterways of the Allegheny River Basin (Reference 1). The statistical procedures were the same as those mentioned for the analysis of the Allegheny River.

Although stream gage records are available for Great Valley Creek, the number of years for which such data are available is less than 15 and is, therefore, too small to be of any significance in determining flood flow-frequency relationship. Gage data were used to compare synthetic results with the historical flooding of 1967 and 1972.

A synthetic rainfall-runoff relationship method, based on a dimensionless unit hydrograph, was used to develop flood flow-frequency relationships. The 24-hour rainfall amounts for frequencies up to 100 years, as obtained from the Rainfall Frequency Atlas of the United States, were plotted on log-normal paper and the rainfall amount for the 500-year frequency was extrapolated from the resulting graph (Reference 7).

The watershed of each stream was divided into subareas to evaluate the hydrologic effects of as many tributaries as would be significant.

The computer program TR-20, developed by the Soil Conservation Service was used to compute surface runoff (Reference 8). It takes

into account conditions affecting runoff such as land use, type of soil, shape and slope of watershed, antecedent moisture condition, and develops a hydrograph and routes the hydrograph through stream channels and reservoirs. The program is designed to combine the routed hydrograph with those from other tributaries and print out the total composite hydrograph peak discharges and times of occurrence at each desired point in the watershed for each storm evaluated. From this data, frequency discharge-drainage area curves were plotted for each evaluation point.

A summary of discharges is shown in Table 1.

TABLE 1 - SUMMARY OF DISCHARGES

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (sq. miles)	PEAK DISCHARGES (cfs) 10-YEAR	50-YEAR	100-YEAR	500-YEAR
ALLEGHENY RIVER					
Downstream Corporate Limits	1,655	37,000	55,000	64,000	91,000
Upstream Corporate Limits	1,609	32,750	49,850	58,800	85,000
LITTLE VALLEY CREEK					
At Mouth	46.4	4,060	6,081	7,025	9,373
GREAT VALLEY CREEK					
X-Section A	139.3	7,800	11,421	12,814	16,713

3.2 Hydraulic Analyses

Analyses of the hydraulic characteristics of streams studied in detail in the community were carried out to provide estimates of the elevations of floods of the selected recurrence intervals along each of these streams.

Flood profiles on the Allegheny River and Little Valley Creek were calculated using the COE HEC-2 Water Surface Profiles Computer Program (Reference 9). Profiles were determined for the 10-, 50-, 100-, and 500-year floods. The locations of selected cross sections used in the hydraulic analysis are shown on the Flood Profiles (Exhibit 1).

Flood profiles on Great Valley Creek were calculated using the Soil Conservation Service WSP-2 Water Surface Profiles Computer Program (Reference 10). This program uses the standard step method, with some modifications, to compute profiles between valley sections. All profiles are computed in the upstream direction. Therefore, only

subcritical flow, a condition normally characteristic of natural streams, can be analyzed. For any super-critical flows encountered the program will assume critical flow and resume computations. At any one road restriction, WSP-2 can compute head losses through one bridge opening or up to five culvert openings with different configurations.

Cross sections were located at close intervals above and below bridges, at control sections along the stream length, and at significant changes in ground relief, land use, or land cover. All cross sections were determined by ground survey methods.

Reach lengths for the channel were measured along the centerline of channel between sections and overbank reach lengths were measured along the approximate centerline of the effective out-of-channel flow area.

For the Allegheny River and Little Valley Creek, roughness coefficients (Manning's "n") ranging from 0.07 to 0.11 in the overbank areas and from 0.025 to 0.04 in the channel were assigned on the basis of on-site field inspections and ground level photographs. These photographs were compared with USGS calibrated photographs (Reference 11), taking into consideration channel conditions, overbank vegetation and land use.

For Great Valley Creek, roughness coefficients (Manning's "n") ranging from 0.06 to 0.085 in the overbank and from 0.055 to 0.065 in the channel were determined by field inspection and based on the National Engineering Handbook (Supplement B) (Reference 12). In arriving at a realistic value due weight was given to the natural materials of which the channel was composed of, surface irregularity, variations in shape and size at cross sections, characteristics of obstructions such as debris deposits, stumps, exposed roots, boulders, fallen and lodged logs, type of vegetation, and degree of meandering.

Flood profiles were drawn showing computed water-surface elevations to an accuracy of 0.5 foot for floods of the selected recurrence intervals (Exhibit 1). For starting profile computations the tail-water elevations on the Allegheny River, as supplied by the COE were used. Starting elevations for Little Valley and Great Valley Creeks were obtained from backwater computations of the Allegheny River. All elevations are referenced to the National Geodetic Vertical Datum of 1929 (NGVD), formerly referred to as mean sea level datum with the 1929 general adjustment; elevation reference marks used in the study are shown on the maps.

For Newton Run, Titus Run, and Tributary Nos. 1, 2 and 3, which were studied by approximate methods, the extent of the 100-year flood was determined using the Special Flood Hazard Boundary Map for Salamanca (Reference 13).

The hydraulic analyses for this study are based only on the effects of unobstructed flow. The flood elevations as shown on the profiles are thus considered valid only if hydraulic structures in general remain unobstructed and other flood control structures operate properly and do not fail.

4.0 FLOOD PLAIN MANAGEMENT APPLICATIONS

A prime purpose of the National Flood Insurance Program is to encourage State and local governments to adopt sound flood plain management programs. Each Flood Insurance Study, therefore, includes a flood boundary map designed to assist communities in developing sound flood plain management measures.

4.1 Flood Boundaries

In order to provide a national standard without regional discrimination, the 100-year flood has been adopted by the FIA as the base flood for purposes of flood plain management measures. The 500-year flood is employed to indicate additional areas of flood risk in the community. For each stream studied in detail, the boundaries of the 100-year and the 500-year floods have been delineated using the flood elevations determined at each cross section; between cross sections, the boundaries were interpolated using topographic maps developed for this study from aerial photographs at a scale of 1"=400', with a contour interval of five feet (Reference 14). In cases where the 100-year and the 500-year flood boundaries are close together, only the 100-year boundary has been shown.

For Newton Run, Titus Run, and Tributary Nos. 1, 2 and 3, which were studied by approximate methods, the 100-year flood boundary was delineated using the Special Flood Hazard Boundary Map for Salamanca (Reference 13).

The boundaries of the 100- and 500-year floods are shown on the Flood Boundary and Floodway Map (Exhibit 3). Small areas within the flood boundaries may lie above the flood elevations, and therefore, may not be subject to flooding; owing to limitations of the map scale, such areas are not shown.

4.2 Floodways

Encroachment on flood plains, such as artificial fill, reduces the flood-carrying capacity, increases the flood heights of streams, and increases flood hazards in areas beyond the encroachment itself. One aspect of flood plain management involves balancing the economic gain from flood plain development against the resulting increase in flood hazard. For purposes of the Flood Insurance Program, the concept of a floodway is used as a tool to assist local communities in this aspect of flood plain management. Under this concept, the area of the 100-year flood is divided into a floodway and a floodway fringe. The floodway is the channel of a stream, plus any adjacent flood plain areas, that must be kept free of encroachment in order that the 100-year flood may be carried without substantial increases in flood heights. Minimum standards of the FIA limit such increases in flood heights to 1.0 foot, provided that hazardous velocities are not produced.

The floodways in this report are presented to local agencies as minimum standards that can be adopted or that can be used as a basis for additional studies.

The floodways presented for the Allegheny River and Little Valley Creek were computed using HEC-2 encroachment methods which are based on equal conveyance reduction from each side of the flood plain. The floodway presented for Great Valley Creek, was computed using the "HUD-15" Computer Program (Reference 15). The results of these computations are tabulated at selected cross sections for each stream studied in detail (Table 2).

As shown on the Flood Boundary and Floodway Map (Exhibit 3), the floodway widths were determined at cross sections; between cross sections, boundaries were interpolated. In cases where the floodway and the 100-year boundaries are close together, or collinear, only the floodway boundary has been shown.

The area between the floodway and the boundary of the 100-year flood is termed the floodway fringe. The floodway fringe thus encompasses the portion of the flood plain that could be completely obstructed without increasing the water-surface elevation of the 100-year flood more than one foot at any point. Typical relationships between the floodway and the floodway fringe and their significance to flood plain development are shown in Figure 6.

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION		
CROSS SECTION	DISTANCE[1]	WIDTH (FT.)	SECTION AREA (SQ. FT.)	MEAN VELOCITY (F.P.S.)	WITH FLOODWAY (NGVD)	WITHOUT FLOODWAY (NGVD)	DIFFERENCE (FT.)
Allegheny River							
A	470	585	7,400	8.65	1,365.5	1,364.5	1.0
B	4,740	680	11,500	5.57	1,371.2	1,370.3	0.9
C	10,310	520	8,280	7.73	1,376.2	1,375.6	0.6
D	16,440	667	11,600	5.52	1,383.3	1,382.5	0.8
E	20,220	738[3]	11,500	5.57	1,386.2	1,385.3	0.9
Little Valley Creek							
A	227[2]	97	549	13.30	1,360.7	1,360.7[4]	0.0
B	377[2]	103	908	9.52	1,363.1	1,363.1[4]	0.0
C	517[2]	89	718	9.65	1,363.4	1,363.3[4]	0.1
D	701[2]	88	1,130	7.50	1,367.8	1,367.7[4]	0.1
E	1,101[2]	309	1,841	3.77	1,368.8	1,368.6[4]	0.2
F	1,501[2]	370	1,671	4.07	1,369.2	1,369.0[4]	0.2
G	2,501[2]	128	754	12.23	1,370.9	1,370.6	0.3

[1]FEET ABOVE CORPORATE LIMITS
[2]FEET ABOVE CONFLUENCE WITH ALLEGHENY RIVER
[3]NOT INCLUDING ADJUSTMENT FOR FLOODWAY ON GREAT VALLEY CREEK
[4]ELEVATIONS COMPUTED WITHOUT CONSIDERATION FOR BACKWATER EFFECTS FROM THE ALLEGHENY RIVER

TABLE 2

DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT
Federal Insurance Administration

CITY OF SALAMANCA, NY
(CATTARAUGUS CO.)

FLOODWAY DATA

ALLEGHENY RIVER AND LITTLE VALLEY CREEKS

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION		
CROSS SECTION	DISTANCE[1]	WIDTH[2] (FT.)	SECTION AREA (SQ. FT.)	MEAN VELOCITY (F.P.S.)	WITH FLOODWAY (NGVD)	WITHOUT FLOODWAY (NGVD)	DIFFERENCE (FT.)
Great Valley Creek							
A	1,100	686	8,697	1.47	1,386.3	1,385.3	1.0
B	3,100	784	8,318	1.54	1,389.7	1,388.7	1.0
C	4,760	270	3,660	3.49	1,391.0	1,390.0	1.0

[1]FEET ABOVE CONFLUENCE WITH ALLEGHENY RIVER
[2]THIS WIDTH EXTENDS BEYOND THE CORPORATE LIMITS

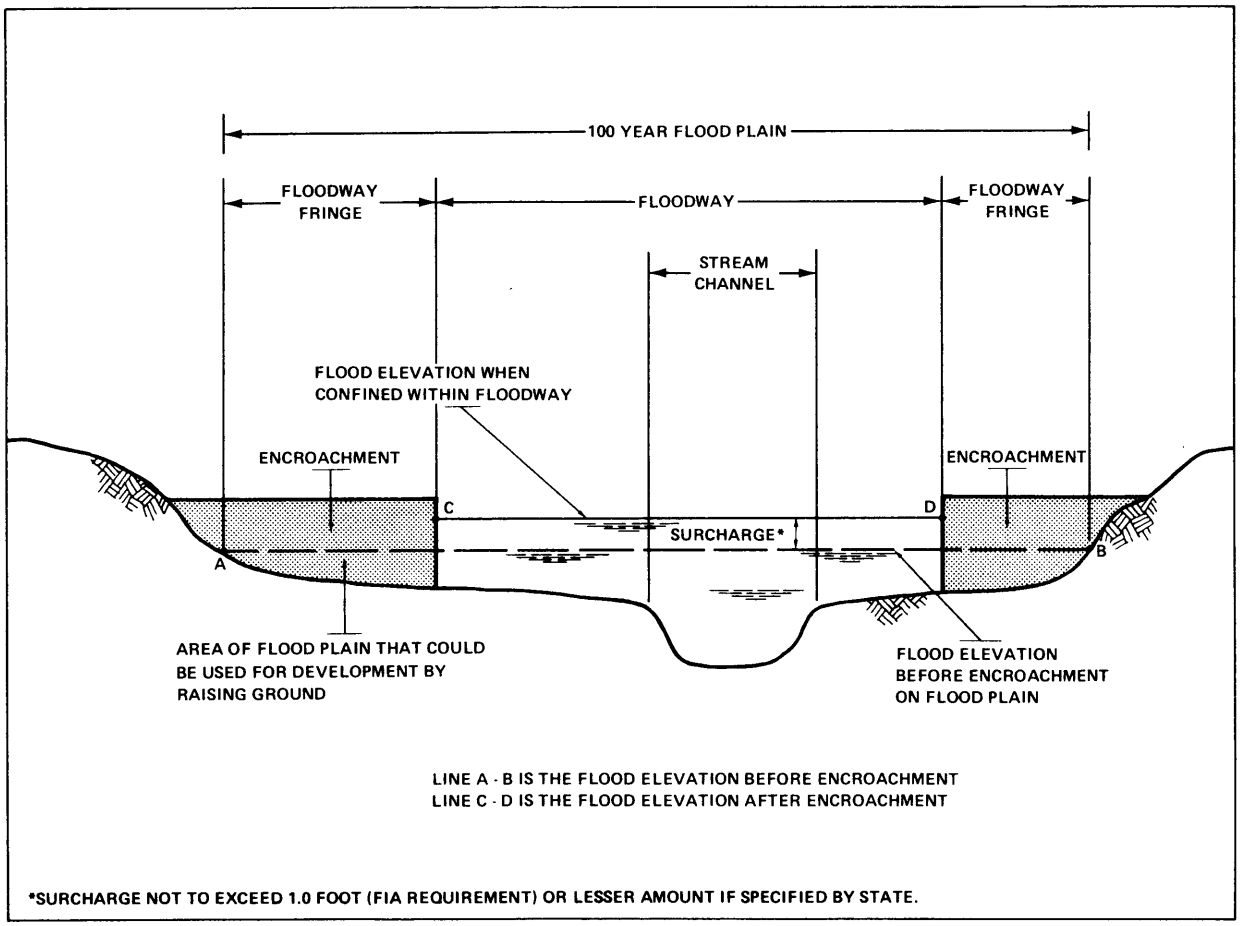
TABLE 2

DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT
Federal Insurance Administration

CITY OF SALAMANCA, NY
(CATTARAUGUS CO.)

FLOODWAY DATA

GREAT VALLEY CREEK



FLOODWAY SCHEMATIC Figure 6

5.0 INSURANCE APPLICATION

In order to establish actuarial insurance rates, the FIA has developed a process to transform the data from the engineering study into flood insurance criteria. This process includes the determination of reaches, Flood Hazard Factors (FHFs), and flood insurance zone designations for each flooding source affecting the City of Salamanca.

5.1 Reach Determinations

Reaches are defined as lengths of watercourses having relatively the same flood hazard, based on the average weighted difference in water-surface elevations between the 10- and 100-year floods. This difference does not have a variation greater than that indicated in the following table for more than 20 percent of the reach.

Average Difference Between 10- and 100-Year Floods	Variation
Less than 2 feet	0.5 foot
2 to 7 feet	1.0 foot

Three reaches meeting the above criteria were required for the flooding sources of Salamanca. They include one each on the Allegheny River, Great Valley Creek, and Little Valley Creek. The locations of these reaches are shown on the Flood Profiles (Exhibit 1).

5.2 Flood Hazard Factors

The FHF is the FIA device used to correlate flood information with insurance rate tables. Correlations between property damages from floods and FHFs are used to set actuarial insurance premium rate tables based on FHFs from 005 to 200.

The FHF for a reach is the average weighted difference between the 10- and 100-year flood water-surface elevations expressed to the nearest one-half foot, and shown as a three-digit code. For example, if the difference between water-surface elevations of the 10- and 100-year floods is 0.7 foot, the FHF is 005; if the difference is 1.4 feet, the FHF is 015; if the difference is 5.0 feet, the FHF is 050. When the difference between the 10- and 100-year water-surface elevations is greater than 10.0 feet, accuracy for the FHF is to the nearest foot.

5.3 Flood Insurance Zones

After the determination of reaches and their respective FHFs, the entire incorporated area of Salamanca was divided into zones, each having a specific flood potential or hazard. Each zone was assigned one of the following flood insurance zone designations:

Zone A:	Special Flood Hazard Areas inundated by the 100-year flood, determined by approximate methods; no base flood elevations shown or FHFs determined.
Zones A3, A10:	Special Flood Hazard Areas inundated by the 100-year flood, determined by detailed methods; base flood elevation shown, and zones assigned according to FHFs.

Zone B: Areas between the Special Flood Hazard Areas and the limits of the 500-year flood, including areas of the 500-year flood plain that are protected from the 100-year flood by dike, levee, or other water control structure; or, areas subject to certain types of 100-year shallow flooding where depths are less than 1.0 foot. Zone B is not subdivided.

Zone C: Areas of minimal flooding.

Table 3, "Flood Insurance Zone Data," summarizes the flood elevation differences, FHFs, flood insurance zones, and base flood elevations for each flooding source studied in detail in the community.

5.4 Flood Insurance Rate Map Description

The Flood Insurance Rate Map for the City of Salamanca is, for insurance purposes, the principal result of the Flood Insurance Study. This map (published separately) contains the official delineation of flood insurance zones and base flood elevation lines. Base flood elevation lines show the locations of the expected whole-foot water-surface elevations of the base (100-year) flood. This map is developed in accordance with the latest flood insurance map preparation guidelines published by the FIA.

6.0 OTHER STUDIES

The U. S. Army Corps of Engineers prepared a Flood Plain Information Report in 1968 which dealt with the area within the city limits of Salamanca (Reference 16). The Flood Plain Information Report shows flood elevations which are generally lower than those reported in this Flood Insurance Study. This disagreement is a direct result of this Flood Insurance Study's use of a longer historical period of record. The historical base was significantly altered during the past several years by the events surrounding tropical storm Agnes (June 1972) and the resultant flooding. The Flood Plain Information Report is developed around events which are referred to as "Intermediate Regional Flood" and "Standard Project Flood," neither of which correspond to the 10-, 50-, 100-, or 500-year events which are standard for development of a Flood Insurance Study.

FLOODING SOURCE	PANEL[1]	ELEVATION DIFFERENCE[2] BETWEEN 1.0% (100-YEAR) FLOOD AND			FHF	ZONE	BASE FLOOD ELEVATION[3]
		10% (10 YR.)	2% (50 YR.)	0.2% (500 YR.)			
Allegheny River Reach 1	02,03	-4.67	-1.58	+3.36	050	A10	Varies
Great Valley Creek Reach 1	03	-4.90	-1.60	+4.70	050	A10	Varies
Little Valley Creek Reach 1	02	-1.50	-0.80	+3.36	015	A3	Varies

[1] FLOOD INSURANCE RATE MAP PANEL
[2] WEIGHTED AVERAGE
[3] ROUNDED TO NEAREST FOOT – SEE MAP

TABLE 3

DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT
Federal Insurance Administration

CITY OF SALAMANCA, NY
(CATTARAUGUS CO.)

FLOOD INSURANCE ZONE DATA

ALLEGHENY RIVER, GREAT VALLEY AND LITTLE VALLEY CREEK

Other Flood Insurance Studies are being prepared for selected communities within the Allegheny River Basin, including the Town of Salamanca, and the Town of Great Valley both of which are contiguous to the City of Salamanca. Other communities being studied at this time include the Towns of Napoli, Cold Spring, and Little Valley. The data presented in this study is in agreement with data for the contiguous communities.

This study is authoritative for purposes of the Flood Insurance Program and the data presented here either supersede or are compatible with previous determinations.

7.0 LOCATION OF DATA

Survey, hydrologic, hydraulic, and other pertinent data used in this study can be obtained by contacting the office of the Federal Insurance Administration, Regional Director, 26 Federal Plaza, New York, New York 10007.

8.0 BIBLIOGRAPHY AND REFERENCES

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REACH
ZONE A10

CORPORATE LIMITS
CENTER STREET
CONFLUENCE OF LITTLE VALLEY CREEK
MAIN STREET
STATE ROUTE 17
CONFLUENCE OF GREAT VALLEY CREEK
CORPORATE LIMITS

ELEVATION IN FEET (NGVD)

1390
1380
1370
1360
1350
1340

A
B
C
D
E

0 2 4 6 8 10 12 14 16 18 20 22

STREAM DISTANCE IN THOUSANDS OF FEET ABOVE CORPORATE LIMITS

LEGEND

- 500 YEAR FLOOD
- 100 YEAR FLOOD
- 50 YEAR FLOOD
- 10 YEAR FLOOD
- STREAM BED
- CROSS SECTION LOCATION (A)

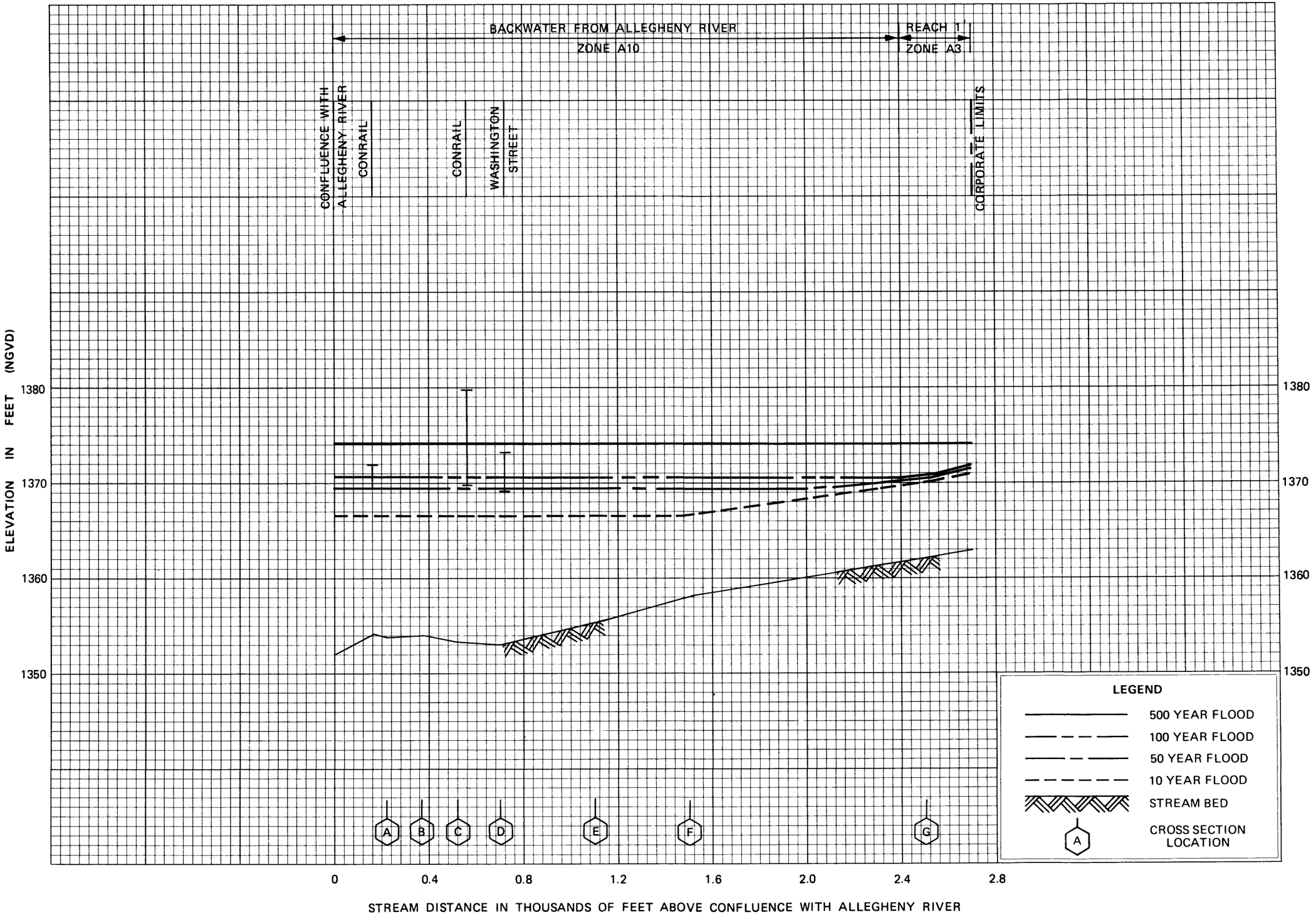
FLOOD PROFILES

ALLEGHENY RIVER

DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT
Federal Insurance Administration

CITY OF SALAMANCA, NY
(CATTARAUGUS CO.)

01P



FLOOD PROFILES

LITTLE VALLEY CREEK

DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT
Federal Insurance Administration

CITY OF SALAMANCA, NY
(CATTARAUGUS CO.)

02P

REACH 1
ZONE A10

CONFLUENCE WITH ALLEGHENY RIVER
CONRAIL
CONRAIL
STATE ROUTE 17 (WILDWOOD AVENUE)
CORPORATE LIMITS

ELEVATION IN FEET (NGVD)

1400
1390
1380
1370
1360

0 0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0 5.5 6.0

STREAM DISTANCE IN THOUSANDS OF FEET ABOVE CONFLUENCE WITH ALLEGHENY RIVER

A
B
C

LEGEND
500 YEAR FLOOD
100 YEAR FLOOD
50 YEAR FLOOD
10 YEAR FLOOD
STREAM BED
A CROSS SECTION LOCATION

FLOOD PROFILES

GREAT VALLEY CREEK

DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT
Federal Insurance Administration

CITY OF SALAMANCA, NY
(CATTARAUGUS CO.)

03P